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10/716,779	11/19/2003	Marc Arques	36278	6162
116	7590	04/18/2005	EXAMINER	
PEARNE & GORDON LLP 1801 EAST 9TH STREET SUITE 1200 CLEVELAND, OH 44114-3108			ROSENBERGER, FREDERICK F	
			ART UNIT	PAPER NUMBER
			2878	

DATE MAILED: 04/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/716,779

Applicant(s)

ARQUES ET AL.

Examiner

Frederick F. Rosenberger

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SN

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 19 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7, 11 and 12 is/are rejected.
- 7) ☒ Claim(s) 5, 6, 8-10 and 13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 November 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 12/15/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Drawings***

2. Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

3. The disclosure is objected to because of the following informalities:  
  
Page 10, line 10: "in other words for example" should be "for example".  
  
Page 10, line 17: "p" is used to refer to the number of inhibition signals but is also used to designate incoming particles in Figure 1 and on page 2, line 1.  
  
Appropriate correction is required.

***Claim Objections***

4. Claims 1 and 5 are objected to because of the following informalities:

In claim 1, line 4, the recitation of "electrical pulses" lacks proper antecedent basis. The above phrase should be changed to "electrical pulse".

In claim 1, line 5, the recitation of "it" is indefinite as it is unclear if "it" refers to the means for delivering the pulse, the means for counting the pulse, or the particle detector itself. For the purposes of this Office action, "it" is taken to refer to the particle detector.

In claim 5, line 11, the recitation of "the output signal" lacks proper antecedent basis. For the purposes of this Office action, "the output signal" is interpreted to be an output signal of the circuit for evaluating a predetermined energy defined in claim 5.

Appropriate correction is required.

5. Claims 8-10 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claims 8-10 have not been further treated on the merits.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1 and 11 are rejected under 35 U.S.C. 102(a) and 35 U.S.C. 102(e) as being anticipated by Menlove et al. (US Patent # 6,420,712).

Menlove et al. disclose a method and apparatus for detection of neutrons using a particle detector comprising:

A neutron detector tube **33** (Figure 1) which provide a means for delivering a first electrical pulse to the pre-amp **41<sub>1</sub>** (Figure 2) based on a detected neutron particle (column 5, lines 14-17);

A commercial coincidence logic circuit that provides a means for counting the first electrical pulse (column 5, lines 31-33);

And a veto circuit (Figure 2 – the center box to the left of arrow **43<sub>1</sub>**) providing a means of creating a second electrical pulse (from the **center** node in Figures 2 and 3) forming a detection inhibition signal starting from a detected particle sent to the two adjacent detectors (to the respective **left** and **right** inputs of the left and right veto circuits in Figure 2). The signal sent from the central detector's veto circuit initiates the veto circuit sequence that provides a means for inhibiting particle detection by the adjacent detectors (column 5, lines 52-59).

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Menlove et al., as applied to claim 1 above, and further in view of Schreck et al. (US Patent # 5,550,379).

Menlove et al. discloses the claimed invention except for the use of a first switch before the counting means and actuated by a control circuit, which can be a "NOR" or "OR" logic gate. Instead, Menlove et al. use a disabling logic circuit consisting of "AND" and "OR" logic gates, flip flop circuits, and pulse generators (column 5, lines 13-26). Schreck et al. show that a switch for disabling a scintillation event output is an equivalent structure to a disabling circuit (column 4, lines 35-43). Therefore, because these two means of inhibiting adjacent detector signals were art-recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute a switch activated by a logic control circuit for the logic control circuit with flip-flop and pulse generator components of Menlove et al.

10. Claims 4 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Menlove et al., as applied to claims 1 and 11 above, and further in view of Lundqvist (US Patent Application Publication 2002/0179844).

Menlove et al. discloses all the limitations of the parent claims 1 and 11, as described above. However, Menlove et al. are silent with regards to the prevention of inhibition signal transmission to neighboring detectors based on pulse energy level and the prevention of the pulse counting based on an inhibition signal from a neighboring detector.

Lundqvist teaches an X-ray imaging method wherein the energy of the detected photon determines the whether the event will be counted. The highest energy photon is counted while the other detector outputs are suppressed so as to improve the detective quantum efficiency (page 4, paragraph 40). Although the specifics of inhibition signal and count prevention are not discussed by Lundqvist, such specifics are implied by the function of the detector array, i.e. the prevention of neighboring signal counting based on signal energy level.

Thus, it would have been obvious to a person having ordinary skill in the art modify Menlove et al. to include a means for the prevention of inhibition signal transmission based on pulse energy level and prevention of pulse counting based on neighboring inhibition signals to allow for improved detection efficiency, as taught by Lundqvist.

11. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Menlove et al., as applied to claim 1 above, and further in view of Sloan (US Patent # 5,483,061).

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Menlove et al. disclose all of the limitations of parent claim 1, as discusses above. However, Menlove et al. are silent with regards to the pulse lengths of the various signals.

Sloan teaches the scenario where the first pulse (bottom curve of Figure 4) of a gamma detector generated along electrical line **125'** (Figure 3) is shorter than the second pulse (top curve of Figure 4) generated by the one-shot multivibrator **126** along line **127**. Sloan uses such a pulse length difference to prevent spurious shock induced scintillation signals from being detected after a gamma-detected event (see Figure 5 and discussion on column 4, 44-60).

Thus, it would have been obvious for a person having ordinary skill in the art to modify Menlove et al. to include a first pulse shorter than the second pulse such that spurious signals are not detected by neighboring detectors until the first pulse has been completed and counted, as taught by Sloan.

#### ***Allowable Subject Matter***

12. Claims 5, 6, and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

13. The following is a statement of reasons for the indication of allowable subject matter:



Claim 5, when incorporating the limitations of parent claims 1 and 4, addresses a particle detector with means for delivering a first electrical pulse based on a detected particle, a means for counting the first electrical pulse, a means for creating a second electrical pulse to act as an inhibition signal to neighboring detectors, a means for inhibiting particle detection by the detector based on signals from neighboring detectors, a second switch receiving the second electrical pulse and outputting to a neighboring detector, an energy evaluation circuit to control the actuation of the second switch based on the energy of the first pulse compared to a predetermined energy, and delay means on the input of the first switch for preventing counting of the first pulse corresponding to a predetermined energy under the action of an inhibition signal output from a neighboring detector. Although aspects of the prior art disclose elements of the parent claims 1 and 4, the prior art does not teach or suggest the limitations of claim 5, specifically the incorporation of the second switch, energy evaluation circuit, and delay means to allow neighboring detectors to detect particles when the energy of the pulse received by the primary detector is at a predetermined level. As such, applicant's disclosure provides a novel and nonobvious improvement over the prior art. Accordingly, claim 5, when incorporating the limitations of claims 1 and 4, would be allowable.

Claim 6 is directed towards a particle detector with the limitations of claim 4 or 5 and the additional limitations of the predetermined energy being a fluorescence photon energy. While energy discrimination techniques are known in the field of particle/X-ray detection, particularly with regards to Compton scattering, the discrimination energy

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level taking the form of a fluorescence photon energy has not been taught or suggested. As such, applicant's disclosure provides a novel and nonobvious improvement over the prior art. Accordingly, claim 6, when incorporating the limitations of claims 4 or 5, would be allowable.

Claim 13, when incorporating the limitations of parent claims 11 and 12, addresses a method for reading a particle detector matrix including a step where a first detector detects a particle and inhibits at least one adjacent second particle detector from detecting, a step for evaluating the energy of the first pulse from the first detector based on a fluorescence photon energy, and a step for preventing transmission of the inhibition signal and counting of the first pulse if a second particle detector detects a particle within a time window. While energy discrimination techniques are known in the field of particle/X-ray detection, particularly with regards to Compton scattering, the discrimination energy level taking the form of a fluorescence photon energy has not been taught or suggested. As such, applicant's disclosure provides a novel and nonobvious improvement over the prior art. Accordingly, claim 13, when incorporating the limitations of claims 11 and 12, would be allowable.

### ***Conclusion***


14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Giraud et al. (US Patent # 4,031,392) disclose a method and device employing inhibition logic circuits in the discrimination of true scintillation events from background scintillations.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frederick F. Rosenberger whose telephone number is 571-272-6107. The examiner can normally be reached on Monday-Friday 7:30 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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